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ABSTRACT

A qualitative study was conducted to determine the perceptions of preservice teachers on how computers will be used in schools in the future. Undergraduate students (n=40) were given a 60-minute multimedia presentation on how computer and multimedia technologies are used in schools, followed by group discussions on the ways in which computers will be used in schools in 10 years, and an assigned one-page essay addressing the topic. The study revealed that preservice teachers have high expectations for using computers in their classrooms, some of which are unrealistic for the next 10 years. Many students felt that assignments and materials will be accessed via electronic mail or the Internet (n=37); software will be personalized, self-paced, and written by students (n=32); virtual reality, CD-ROMs, and holograms will be commonplace (n=31); and computers will be voice-activated and have touch-screens (n=30). Other students felt the teacher will still be the center of the classroom and computers will be used for grades and attendance records (n=25); every student will have a computer (n=23); computers will replace books and floppy disks will replace paper (n=18); computers will control fire drills, demonstrations, and career exploration (n=13); computer equipment will not be expensive and computer access will be limited (n=1). Student perceptions and further research are discussed. (Contains 10 references.) (SWC)

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A QUALITATIVE LOOK AT PRESERVICE TEACHER'S PERCEPTIONS OF THE FUTURE OF COMPUTERS IN EDUCATION

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The use of computers in education is a relatively new realm. There is no scientific basis for predicting its future. Although numerous studies focus upon people's attitudes toward the present-day use of computers in education, relatively few studies analyze people's perceptions of how computers will be used in education in the future. Perhaps the best source of information about the future of computers in the field of education is the opinions and perceptions of future educators.

Research in the area of attitudes toward computers has been extensive in the last several years. Ellsworth and Bowman (1984) found that students who were exposed more to computers were more likely to develop positive attitudes about them. Arndt, Clevenger, and Meiskey (1985) reported that students who viewed computers in a positive manner possessed more computer experience than those who viewed computers in a negative manner. Temple and Lips (1989) reported that gender also influenced students attitudes toward computers. They found that undergraduate males reported feeling more comfortable using computers than undergraduate females did. Smith (1987) found that elementary students were more confident than high school students in their ability to use computer. And Campbell reported that student self-assessment of computer literacy skills affects enrollment in computer courses (Campbell--abstract).

Recently, several research studies have explored the perceptions of professionals and students on aspects of the field of educational technology. Sullivan, Igoe, Klein, Jones, & Savenye (1993) studied the opinions of university faculty, graduate students, and personnel employed in training positions on the future of the field of educational technology. A survey composed of six topic areas was used to gather the data. Two of the six topic areas investigated were: *Technology and Individualized Instruction* and *Advances in Technology*.

In respect to *Technology and Individualized Instruction*, respondents showed relatively high overall agreement with statements such as "Computer-based instruction will result in much greater individualization of instruction" and "Computer-delivered instruction will benefit individual students by enabling them to manage their own learning to a greater extent". Master's students had significantly greater agreement than faculty that CBI will result in much more individualized instruction.

Regarding *Advances in Technology*, respondents did not show strong general agreement with statements such as "Technology-as-hardware will have a greater influence in education and training than technology as instructional systems design", "The role of instructional designers will shift from designing instruction to creating systems that design it", and "Expert systems will design effective instruction sequences or programs with minimal human input." A significant difference was found only on this last item in that master's students showed stronger agreement than either doctoral students or faculty members.

The purpose of the present study was to determine the perceptions of preservice teachers on how computers will be used in schools in the future. Subjects were university students. These students represent a less experienced and educated group than Sullivan, Igoe, Klein, Jones, & Savenye's (1993) faculty, graduate students, or trainers.

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METHOD

Subjects

Participants in the study were 40 undergraduate students enrolled in an introductory computer course at a large southwestern university. The majority were education majors with varying concentration areas, but students from other academic disciplines participated as well. Computer experience varied among the subject population.

Procedures

Students were given a sixty minute presentation/demonstration on how computer and multimedia technologies are used in schools. After a brief introductory overview of what multimedia is and how it is used in education, students were shown a 10-minute video about the TLTG interactive video physical science curriculum. Students were then given demonstrations of several HyperCard-based CAI programs. Hands-on experience was not included in the presentation, only overhead visuals, video, and verbal explanations.

After the presentation, students were told to discuss in groups for 10 minutes ways in which computers will be used in schools 10 years from now. A group spokesperson then gave a 15 minute report on the ideas and opinions formulated in his/her group's discussion.

A follow-up project was then assigned to the class. Individually, the students were to write a one-page essay addressing the question previously discussed in class. The papers were collected one week later in the next regular class session. Extra course credit was given to each student that turned in a paper.

The study was qualitative in nature. Student responses were categorized and the categories were collapsed.

RESULTS

Data gathered from student essays is shown in Table 1. 37 students stated that they thought that assignments and materials would be accessed via e-mail or the internet. 32 students indicated that they thought that software would be personalized, self-paced, and written by students, while 31 said that virtual reality, CD roms, and holograms would be commonplace. 30 students stated that they thought that computers would be voice-activated and have touch-screens, while 25 students stated that they thought the teacher would still be the center of the classroom and computers would be used for grades and attendance records. 23 students volunteered that they thought that every student would have a computer and 18 students stated that computers will replace books and floppy disks will replace paper. 13 students wrote that they thought computers will control fire drills, demonstrations, and career exploration. 1 student each felt that computer equipment will not be expensive and computer access will be limited.

DISCUSSION

The present study examined the perceptions of preservice teachers on how computers will be used in schools 10 years from now. Many students stated that they thought assignments and materials would be accessed via e-mail or the internet, software would be personalized and self-paced, computers would be voice-activated and have touch-screens, and virtual reality, CD roms, and holograms would be commonplace. Other students stated that they thought that every student would have a computer, computers will replace books and floppy disks will replace paper, and the teacher would still be the center of the classroom. And a few students thought computers will control fire drills, demonstrations, and career exploration, computer equipment will be inexpensive, and computer access will be limited.

The overall findings of this study support the findings of Marcinkiewicz (1994). He states that pre-service teachers have high expectations of using computers in their classrooms. Statements made by the students in this study, such as "there will be one computer for every student" and "assignments will be accessed via e-mail", also reveal high expectations for the use of computers in the classroom. However, the original question that students in the present study had to answer involved the future of computers in the classroom 10 years from now. Perhaps some of their expectations were too high for that time frame.

Students receiving assignments from an on-line network, floppy disks replacing paper, and every student having their own computer may certainly happen in education in the future, but the likelihood of them happening in the next 10 years is doubtful. Granted, some students in some computer classes are

required to retrieve their assignments on line, but for this to become commonplace it will necessitate all students having an individual terminal. According to O'Donnell (1993) "the cost of computer systems has dropped to the point where almost anyone who desires to own a computer can now afford one". Unfortunately, public education isn't for almost anyone, it's for everyone. Until computers are inexpensive enough for school systems to purchase one for every student, assignments will still be given by the teacher and paper will be more widely used than floppy disks.

While some of the students perceptions may have been a bit beyond the requested time-frame, other perceptions were more accurate. Many of the resources the students thought would be in place in schools in 10 years are happening now. Many schools presently have information accessible in CD rom format, voice and touch-screen activated computers for physically challenged students, and track grades and attendance via computer. While these capabilities are not as universal as they may become, they certainly are in place at the present time. Whether the students in this study said that these capabilities were futuristic was due to a keen awareness of what is going on in schools today or the complete opposite is unknown. It is perhaps a bit of both.

Two of the more popular responses that seem to conflict are that teachers will remain the center of the classroom (25 responses) and students will write their software to teach themselves at a more personal, self-paced level (32 responses). By allowing students to write their own instructional software would permit them to make their own instructional choices. Allowing students to make their own instructional choices has been termed "learner-control".

The effects of learner-control on student achievement is inconclusive. Some research results indicate that individuals learn more when given control over their instruction. Ross, Morrison, & O'Dell (1989) reported that higher posttest scores were obtained by undergraduate education majors who were allowed to select the instructional presentation medium than by students who were not. Other research indicates that individuals learn less effectively when given control over their instruction. Pollack and Sullivan (1990) found that seventh-grade science students receiving required practice items had higher posttest scores than students allowed control over the amount of practice they received. Until the effects of learner-control on achievement can be conclusively determined, it may be better to allow teachers to write instructional software instead of students, regardless of the technological capabilities of the time. The implication of a recommendation such as this one is that until research can prove that they are not beneficial to education, teachers should remain at the center of the classroom.

Further research on educators perceptions of the future of computers in their field could include comparisons between preservice teachers ideas of how computers are used in the classroom today and how practicing teachers actually use them. Also, long-range data could be gathered on how preservice teachers estimate they will use computers in their future classrooms and then on how they do use them when they become teachers. Research such as this can help us to better determine the direction computers will take in education in the future.

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Table 1

Perceptions of Computers Usage in Schools 10 Years in the Future

Perception	Number of Responses
Assignments, materials, library information, gotten from the internet and e-mail	37
Students write their own personalized, self-paced, software for all subjects.	32
Virtual reality, holograms, CD Roms, real-time capabilities are commonplace.	31
Computers are voice-activated, have touch-screens, recognize thumbprint ID's , and speak.	30
Teachers are the center of the classroom and use a (hand-held) computer for grades and attendance.	25
There is 1 computer for every student, even in poor and rural school districts.	23
There are portable computers instead of books, floppy disks instead of paper, videos instead of field trips, computerized chalkboards, and lightpens.	18
Computers are used for fire drills, demonstrations, speakers, tutorials, research, creativity development, career exploration, and word processing.	13
Computer equipment is not very expensive.	1
Access to computers and software is limited.	1

N = 40. Students could mention a number of responses. Categories were condensed.